

Is it possible that the light of a full moon can enhance DX on 80 meters? Before you laugh, go check your logs and see if they match up with what W7DD discovered.

80 Meter DX—The Moon Effect

BY DONALD L. ANDERSON,* W7DD

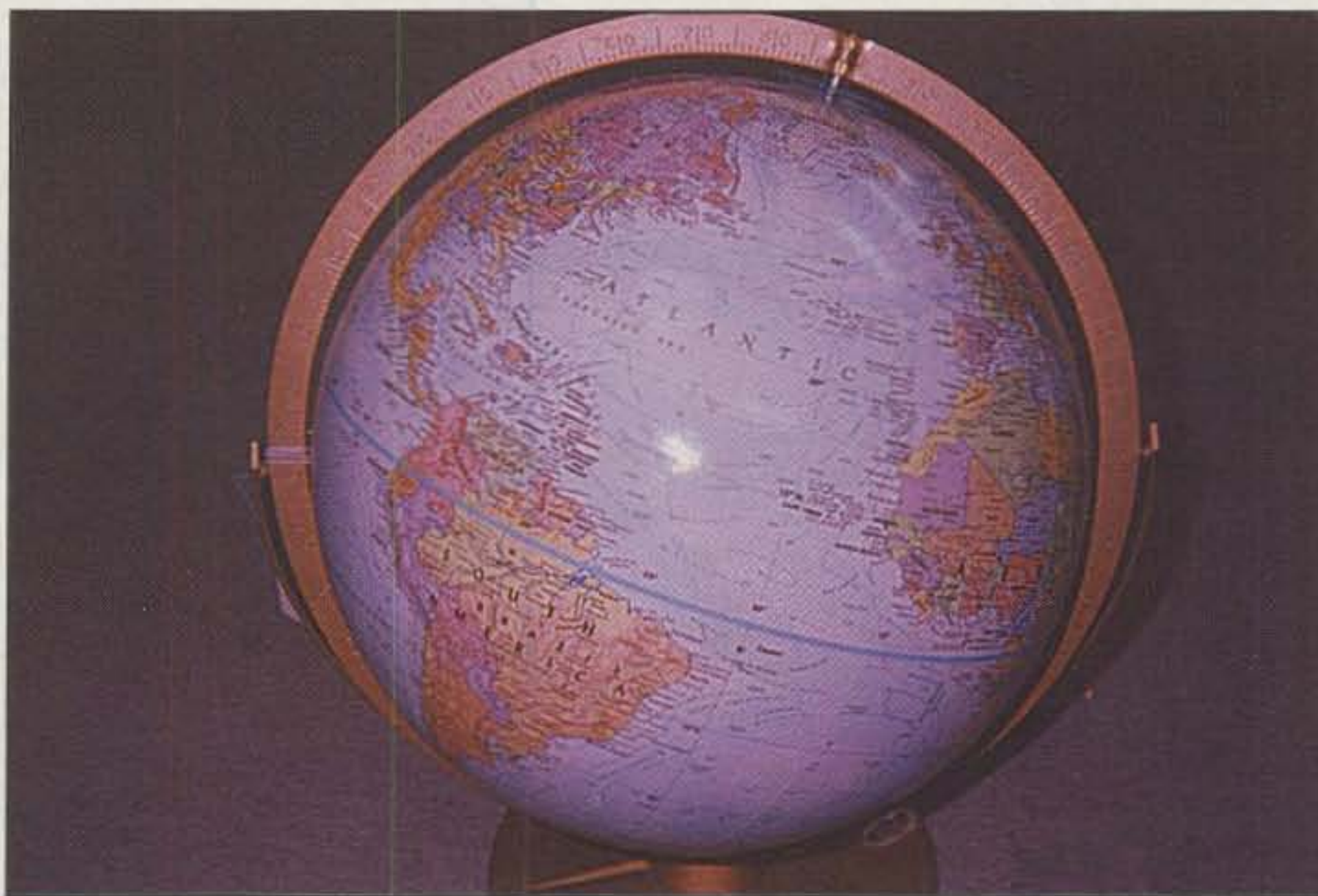
Many years ago I noticed a phenomenon on the 80 meter band when working DX. It seemed that one night each month the band would be incredibly good. From Arizona I would work 30 to 50 Europeans in one evening. A few days before and after that day would also be above average. As this time period passed, the following weeks would be back to the normal poor band conditions I had learned to expect.

I wondered for years why this was happening. It was not tied to any propagation indicator I knew of. Well, it happened again on December 11, 2000, and as usual, I wondered why. I went to bed, and at about 2 AM I awoke to find an amazing amount of light in the bedroom. I jumped up and looked out the window and was met by a giant, very bright moon. It was a full moon. I thought to myself, "I could easily walk through the desert without hitting a bush or a cactus with this light."

While thinking about the sight I had just witnessed, I began to wonder if it could have had any bearing on the wonderful evening of DX I had just finished two hours earlier. I quickly went into the ham shack and checked my logs going back several years and then got on the internet and checked the moon phases. Wow . . . They matched the full moon dates perfectly! I decided to double check this by looking at the "DX Summit" archives. I checked spots put out on me on "DX Summit" for the year 2000 from Europe using the short path. This also matched the full moon dates.

Now that I had the timing matching perfectly, I wondered why this was happening. Could this be moonbounce? No, I thought, that couldn't be, because the signals were coming from the correct direction. I have 12 Beverage receiving antennas and find directions to

*4325 W. Ironwood Hill Dr., Tucson, AZ 85745
e-mail: <w7dd@arrl.net>



Globe aligned and centered showing Europe to Arizona enhancement area. View as if seen from a full moon in winter.

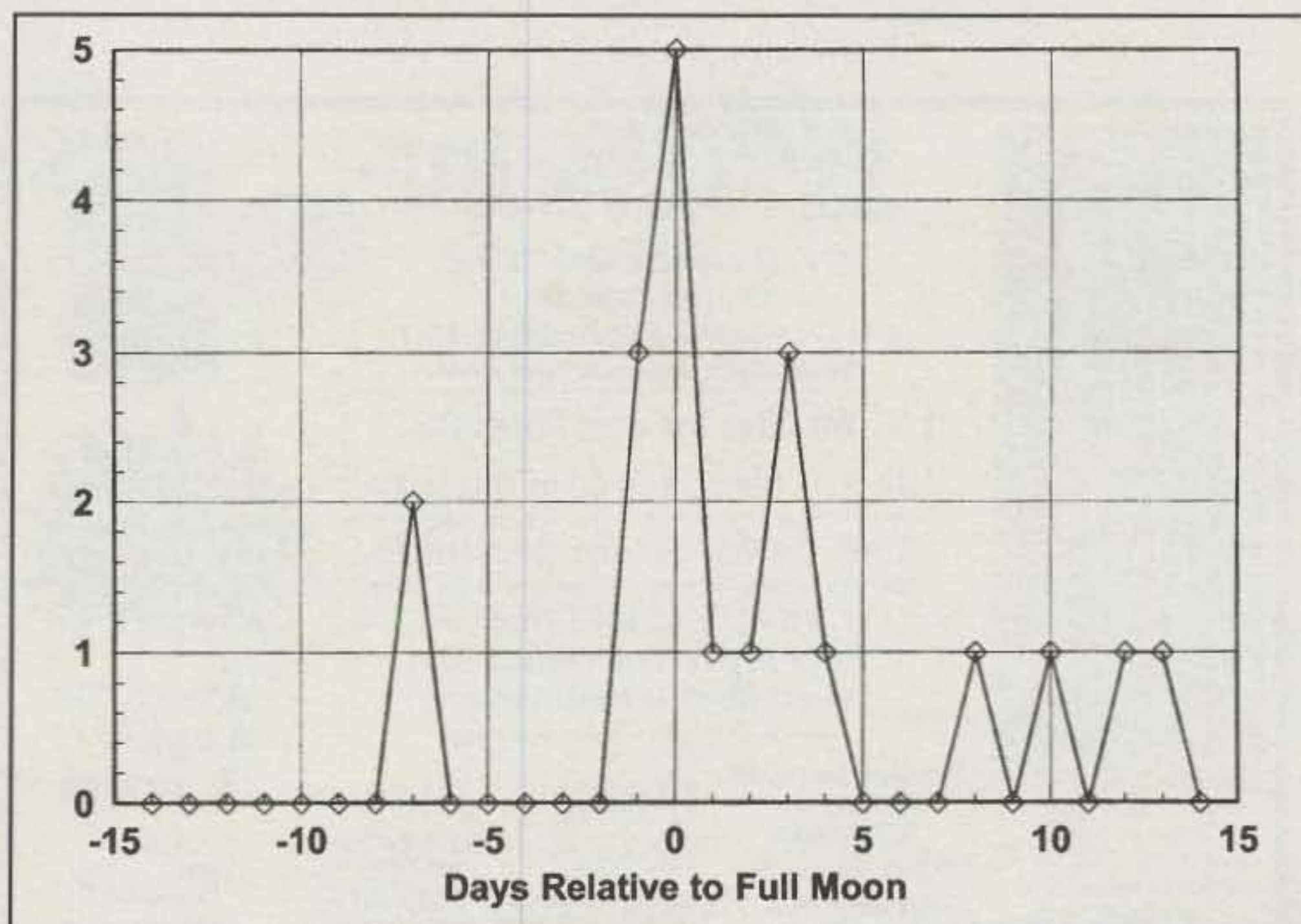


Fig. 1—DX spots from "DX Summit" archives for the year 2000. Short-path spots for W7DD posted by Europe.

You can expect to see a full moon over the next year on the following dates, give or take a day based on where you are:

November 1 & November 30, 2001
 December 30, 2001
 January 28, 2002
 February 27, 2002
 March 28, 2002
 April 26, 2002
 May 26, 2002
 June 24, 2002
 July 24, 2002
 August 22, 2002
 September 21, 2002
 October 21, 2002
 November 19, 2002
 December 19, 2002

Table 1— Full moon dates for 2001–02.

an accuracy of about 25 degrees. Also, the *F*-layer would not allow the low-frequency signals to pass through to the moon. The *F*-layer is about 400 km above the Earth. Waves are reflected back to Earth by this layer. A single hop can be about 3000 km long.

Then it hit me: The *F*-layer was being reinforced by the sun's light reflected off the moon. There must be enough light to reinforce the *F*-layer ionization while still not activating ionization of the *D*-layer, and thus no absorption. The *D*-layer is located below the *F*-layer at a height of about 75 km. The *F*-layer itself attenuates the light getting to the *D*-layer. The *D*-layer's effect on commu-

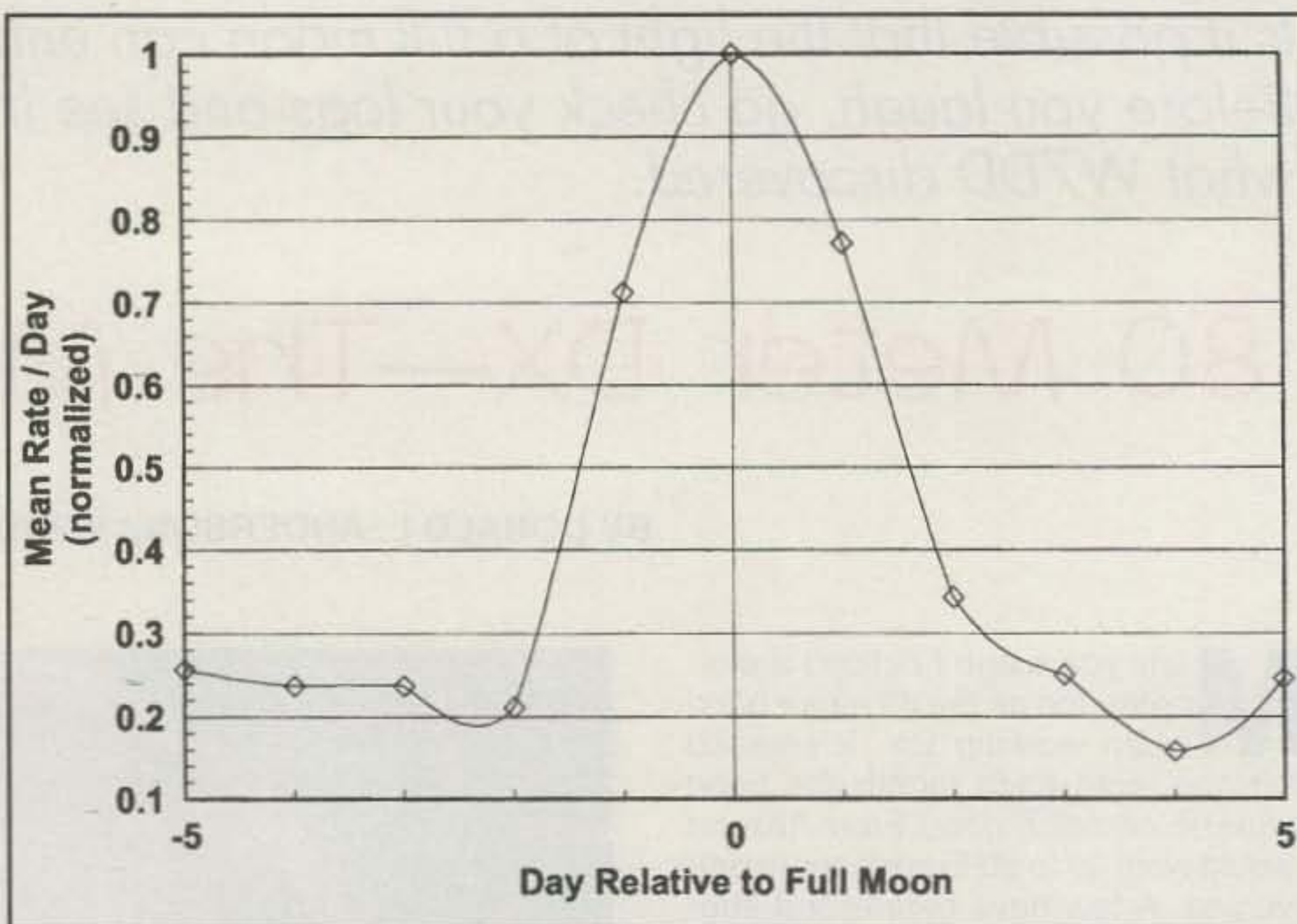


Fig. 2— Correlation chart showing QSO rate based on full moon days. Data is for one year. QSOs with Europe from Arizona on the short path.

nications is a negative one because it causes absorption of the signal.

I finally went back to bed and got a few hours of sleep. I have been told, though, that an 80 meter DXer only sleeps in the summer.

A view of Earth as seen by the moon is available on the website: <<http://www.fourmilab.to/cgi-bin/uncgi/Earth/action?opt=-m>> and continuously updates. (If you can't get through directly at this URL, try <<http://www.fourmilab.to/earthview/>> and click on view of the Earth from the moon. If you're in Europe, use fourmilab.ch instead of fourmilab.to.)

The center of the Earth, as seen on the website, is closest to the moon and would receive the most reflected light. This is the area where the *F*-layer enhancement is most pronounced. This is a moving area and must be monitored using the website's picture of the Earth. I now see that when the center of the Earth, as seen on the above website, is located between the two stations—i.e., Arizona and Europe—the maximum enhancement occurs. This is exactly when my logs show the strong signal reports and QSOs with 100 watt Europeans. Picking any two points on Earth and then checking the view from the moon will show the possibilities of propagation enhancement. This enhancement is independent of the gray line. It can affect the gray-line propagation in some oblique ways by widening the line slightly if the enhanced area is on the gray line. This can add even more strength to gray-line signals. This phenomenon is not consistent with daytime operation, as the sun's direct light is vastly greater than the reflected moon light, even the full moon light. The light given off from the full moon is just a "booster shot"—a very welcome booster shot for the low bander.

Moon information is plentiful on the internet. I typed in "moon phases" and received a wealth of information on Google.

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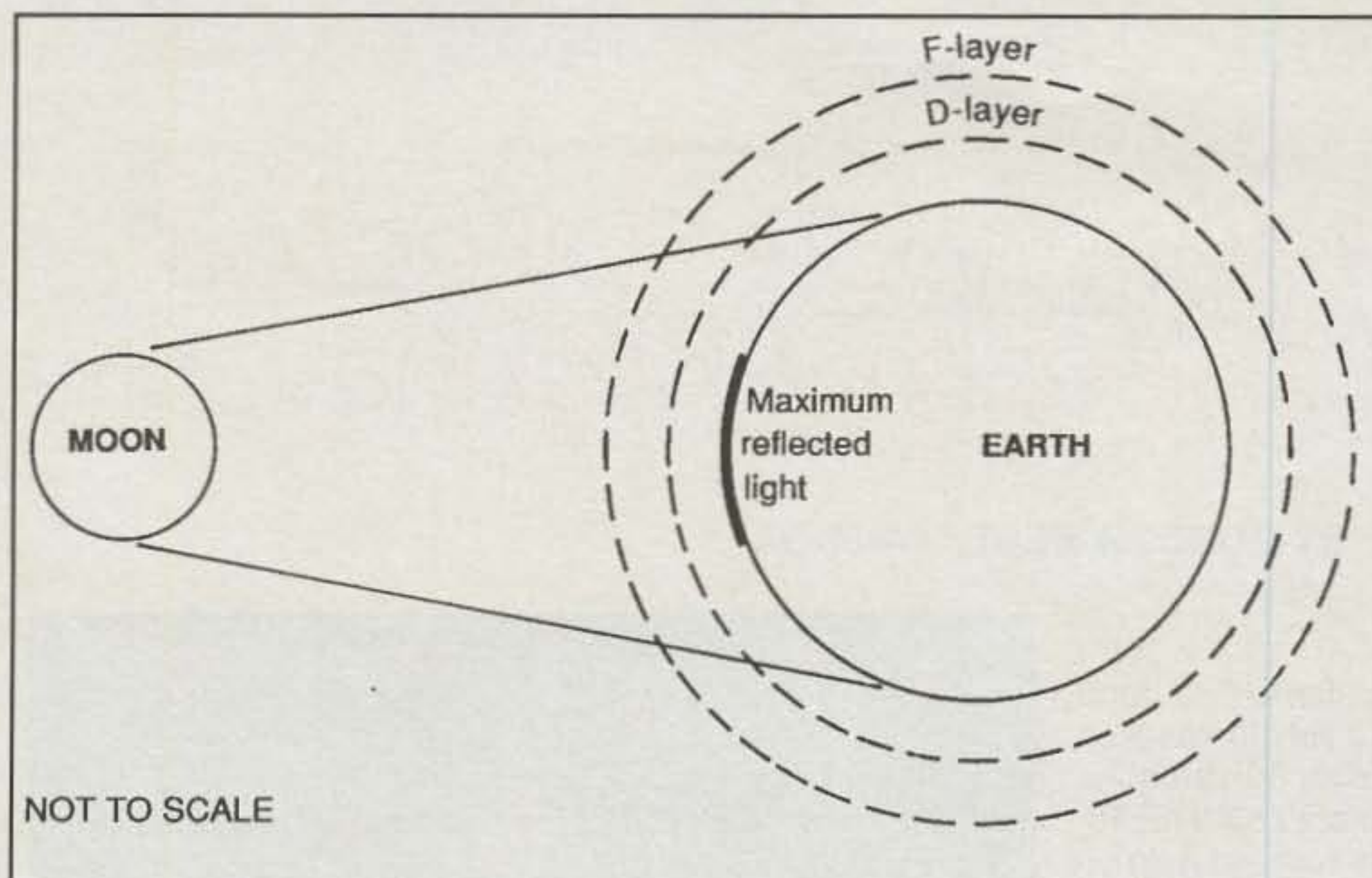


Fig. 3— F-layer and D-layer relationship, plus area of maximum reflected light on the Earth from the moon.

In conclusion, I am convinced that this phenomenon is happening, but I am only one ham. We need more input on this subject. Different places on Earth will have different relationships to the moon enhancement. I ask all low-band

enthusiasts to keep this idea in mind, and maybe we can increase our database on this new tool. Bent-path propagation information should be very interesting once we hear more from hams around the world telling us of their bent-

path observations with respect to the full moon enhancement. We only have a few days each month to make these observations, so we must watch the calendar. The full moon date and a few days after seem most active in Arizona.

Once in a Blue Moon...

We chose to run Don's article in this issue because November 2001 is one of those rare months which contains two full moons, the second of which is commonly (but incorrectly) known as a "blue moon." This is the first two-full-moon month since 1999 and the last until 2004. It is interesting to note that if you live in the western United States, your two full moons will actually come in October, since the precise time of the November 1 (UTC) full moon will be reached on October 31 local time. Also, if you live in eastern Europe and Asia, the November 30 (UTC) full moon will actually occur on December 1 local time, so you'll have your two full moons in December!

For more on the timings of the full moon, see www.obliquity.com/astro/blue2001.html. If you want to find out why calling the second full moon in one month a "blue moon" is technically incorrect, see the *Sky & Telescope* magazine website at www.skypub.com/sights/moonplanets/9905bluemoon.html. —W2VU

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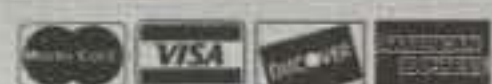
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